AMENDMENTS TO THE CLAIMS

Please accept amended claims 8 and 15 and new claim 21 as follows:

1. (Previously Presented) A method for determining a circle in a region of interest comprising the steps of:

extracting a first pair of edge points along an *x*-axis of the region of interest;

extracting a second pair of edge points along a *y*-axis of the region of interest;

determining an intersection of a first and second line extending perpendicular from a pair of midpoints of the first and second pair of edge points respectively;

determining a radius from the intersection to any edge point; and

determining the circle upon determining a connectivity of the first and second pair of edge points.

2. (Original) The method of claim 1, wherein the *x*-axis and the *y*-axis intersect within the circle.

3. (Original) The method of claim 1, wherein the circle is completely contained within the region of interest, and the circle is the dominant feature within the region of interest.

4. (Original) The method of claim 1, further comprising the step of verifying the edge points comprising the steps of:

scanning the image along the *x*-axis of the region of interest;

scanning the image along the *y*-axis of the region of interest;

performing a horizontal gradient and a vertical gradient along the *x* and *y*-axis of the region of interest respectively; and

determining whether a local maximum along the gradients match the coordinates for any edge point.

5. (Original) The method of claim 4, wherein the step of determining the match comprises the steps of:

searching from each edge of the region of interest, inward to determine the local maximum; and

determining whether the local maximum matches the coordinates for any edge point.

6. (Original) The method of claim 4, wherein the step of determining the match comprises the steps of:

determining a position, relative to the circle of a foreign structure;

if the foreign structure are inside, searching from each edge of the region of interest, inward, to determine the local maximum;

if the foreign structure are outside, searching from the center of the region of interest, outward, to determine the local maximum;

if the foreign structure is both inside and outside the circle, randomly scan at a plurality of points each axis of the region of interest within 1/2 of the total axis length, conduct a gradient operation at each point scanned, determine a plurality of potential edge points, calculate a coordinate for center of the circle, save the coordinate in an array, determine, based on the plurality of edge points a median value for each coordinate of the center of the circle; and

determining whether the local maximum matches the coordinates for any edge point.

7. (Original) The method of claim 1, wherein the region of interest is selected manually.

8. (Currently Amended) A method for determining a circle in an image, comprising the steps of:

extracting a first pair of edge points along an *x*-axis of the image;

extracting a second pair of edge points along a *y*-axis of the image; ~~and~~

determining an intersection of a first and second line extending perpendicular from a pair of midpoints of the first and second pair of edge points respectively;

determining the circle by verifying a connectivity of adjacent edge points in a gradient array of the image; and

verifying the circle by comparing radiuses from at least two edge points to the intersection.

9. (Original) The method of claim 8, further comprising the step of determining a radius from the intersection to any edge point.

10. (Original) The method of claim 8, wherein the *x*-axis and the *y*-axis intersect within the circle.

11. (Original) The method of claim 10, wherein the image contains the whole circle, and the circle being the dominant feature within the image.

12. (Original) The method of claim 8, further comprising the step of verifying the edge points comprising the steps of:

scanning the image along the *x*-axis;

scanning the image along the *y*-axis;

performing a horizontal gradient and a vertical gradient along the *x* and *y*-axis respectively; and

determining whether a local maximum along the gradients match the coordinates for any edge point.

13. (Original) The method of claim 12, wherein the step of determining the match comprises the steps of:

searching from each edge of the image, inward to determine the local maximum; and

determining whether the local maximum matches the coordinates for any edge point.

14. (Original) The method of claim 12, wherein the step of determining a match comprises the steps of:

determining a position, relative to the circle of a foreign structure;

if the foreign structure are inside, searching from each edge of the image, inward, to determine the local maximum;

if the foreign structure are outside, searching from the center of the image, outward, to determine the local maximum;

if the foreign structure is both inside and outside the circle, randomly scan at a plurality of points each axis of the image within 1/2 of the total axis length,

conduct a gradient operation at each point scanned, determine a plurality of potential edge points, calculate a coordinate for a center of the circle, save the coordinate in an array, determine, based on the plurality of edge points a median value for each coordinate of the center of the circle; and

determining whether the local maximum matches the coordinates for any edge point.

R01
COL 4

15. (Currently Amended) A computer program product comprising:

a computer usable medium having computer readable program code embodied therein for causing the computer to detect a circle within an image, the computer readable program code in the computer program product comprising:

computer readable program code for causing the computer to extract a first pair of edge points along an *x*-axis of the image;

computer readable program code for causing the computer to extract a second pair of edge points along a *y*-axis of the image;

computer readable program code for causing the computer to determine an intersection of a first line and a second line extending perpendicular from a midpoint of the first and second edge points respectively; ~~and~~

computer readable program code for causing the computer to determine a radius from the intersection to any edge point;

computer readable program code for causing the computer to determine the circle by verifying a connectivity of adjacent edge points in a gradient array of the image; and

computer readable program code for causing the computer to verify the circle by comparing radiuses from at least two edge points to the intersection.

16. (Original) The computer usable medium of claim 15, further comprising computer readable program code embodied therein for causing the computer to verify the edge points, the computer readable program code in the computer program product comprising:

computer readable program code for causing the computer to scan the image along an *x*-axis;

computer readable program code for causing the computer to scan the image along a *y*-axis;

computer readable program code for causing the computer to perform a horizontal gradient and a vertical gradient along the *x* and *y*-axis respectively, wherein the *x* and *y*-axis intersect within the circle; and

computer readable program code for causing the computer to determine whether a local maximum along the gradients match the coordinates for any edge point.

17. (Original) The computer usable medium of claim 16, wherein the computer readable program code for causing the computer to determine a match further comprises:

computer readable program code for causing the computer to search from each edge of the image, inward to determine the local maximum; and

computer readable program code for causing the computer to determine whether the local maximum matches the coordinates for any edge point.

18. (Original) The computer usable medium of claim 16, wherein the computer readable program code for causing the computer to determine a match further comprises:

computer readable program code for causing the computer to determine the position, relative to the circle of a foreign structure;

if the foreign structures are inside, searching from each edge of the image, inward, to determine the local maximum;

if the foreign structures are outside, searching from the center of the image, outward, to determine the local maximum;

if the foreign structure is both inside and outside the circle, randomly scan at a plurality of points each axis of the image within ½ of the total axis length, conduct a gradient operation at each point scanned, determine a plurality of potential edge points, calculate a coordinate for a center of the circle, save the coordinate in an array, determine, based on the plurality of edge points a median value for each coordinate of the center of the circle; and

computer readable program code for causing the computer to determine whether the local maximum matches the coordinates for any edge point.

19. (Previously Presented) The method of claim 8, further comprising, determining the circle upon determining a connectivity of the first and second pair of edge points.

20. (Previously Presented) The computer usable medium of claim 15, further comprising, computer readable program code for determining the circle upon determining a connectivity of the first and second pair of edge points.

21. (New) The method of claim 1, further comprising verifying the circle by comparing radiuses from at least two edge points to the intersection.